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DRINKING WATER SURVEILLANCE PROGRAM

**NORTH BAY
WATER TREATMENT
PLANT**

REPORT FOR 1991 AND 1992

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**NORTH BAY WATER TREATMENT PLANT
DRINKING WATER SURVEILLANCE PROGRAM
REPORT FOR 1991 AND 1992**

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

NORTH BAY WATER TREATMENT PLANT 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The North Bay water treatment plant is a pumping station which partially treats water from Trout Lake. The process consists of pH adjustment, fluoridation and disinfection. This plant has a rated capacity of $22.5 \times 1000 \text{ m}^3/\text{day}$. The North Bay water treatment plant serves a population of approximately 50,000.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The North Bay water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '-' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE			RAW			TREATED			HERMAN CR			GORMAN ST		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	30	22	73	10	1	10	8	8	100	7	1	14			
CHEMISTRY (FIELD)	30	30	100	60	60	100	78	76	97	70	68	97			
CHEMISTRY (LABORATORY)	226	184	81	230	182	79	320	297	92	280	255	91			
METALS	240	69	28	240	66	27	345	140	40	322	114	35			
CHLOROAROMATICS	112	0	0	126	0	0	98	0	0	98	0	0			
CHLOROPHENOLS	6	0	0	6	0	0	-	-	-	-	-	-			
PESTICIDES AND PCB	268	0	0	289	1	0	154	0	0	155	0	0			
PHENOLICS	10	0	0	10	0	0	-	-	-	-	-	-			
POLYAROMATIC HYDROCARBONS	51	0	0	51	0	0	51	0	0	17	0	0			
SPECIFIC PESTICIDES	14	0	0	15	0	0	1	0	0	1	0	0			
VOLATILES	298	3	1	269	27	10	207	21	10	207	21	10			
RADIONUCLIDES	21	4	19	21	3	14	-	-	-	-	-	-			
TOTAL	1,306	312		1,327	340		1,262	542		1,157	459				

DRINKING WATER SURVEILLANCE PROGRAM

NORTH BAY WATER TREATMENT PLANT 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the North Bay water treatment plant in the spring of 1987. Previous annual reports have been published for 1987, 1988, 1989 and 1990.

PLANT DESCRIPTION

The North Bay water treatment plant is a pumping station which partially treats water from Trout Lake. The process consists of pH adjustment, fluoridation and disinfection. This plant has a rated capacity of $22.5 \times 1000 \text{ m}^3/\text{day}$. The North Bay water treatment plant serves a population of approximately 50,000.

The sample day flows ranged from $25.3 \times 1000 \text{ m}^3/\text{day}$ to $47.6 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration.

Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative

sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;**
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
GUIDELINE VALUES; AND**
- POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed samples.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C after 48 hours) in the ODWOs is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count.

Standard plate count (membrane filtration) exceeded the ODWO Aesthetic Objective of 500 counts/mL in 1 of 24 treated and distributed water samples with a maximum reported value of 560 counts/mL.

INORGANIC & PHYSICAL

CHEMISTRY (LABORATORY)

Alkalinity was below the ODWO Recommended Operational Guideline of 30-500 mg/L in all 25 treated and distributed water samples with values ranging from 14.5 mg/L to 22.1 mg/L.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption. Water supplies with low hardness and alkalinity levels tend to be more aggressive and may cause corrosion problems in the distribution system.

Hardness was below the ODWO Recommended Operational Guideline of 80-100 mg/L in all 25 treated and distributed water samples with values ranging from 21.0 mg/L to 28.0 mg/L.

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 19 of 25 treated and distributed water samples with a maximum reported value of 8.5 HZU.

METALS

For treated and distribution free-flow water samples, the results of the metal scan showed that none were detected above the guidelines.

The presence of elevated lead in standing samples from the distribution system indicates that household taps should be flushed, until the coolest water temperature is obtained, before water is used for consumption. The concentration of lead and other

metals can increase while the water is standing in the service line and home plumbing. The health related ODWO for lead is applied to the free flowing sample.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that one parameter was detected at a trace level in one treated water sample.

PESTICIDES AND PCB

Hexachlorocyclopentadiene was found at a positive level in 1 of the 12 treated and distributed water samples analyzed. The maximum observed level was 70.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

PHENOLICS

The results of the phenol test showed that none were detected above trace levels.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are

reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 24 treated and distributed water samples analyzed with a maximum level of 53.1 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

THMs were detected at positive levels in one raw water sample. Where prechlorination is practiced, the operator must ensure that no chlorine is present in the pumping chamber or discharge line and that the pumps are in operation for some time before the raw water sample is taken.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

No known health related guidelines were exceeded.

The North Bay water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

The current MOEE policy (#15-14) requires that surface waters be provided with treatment processes consisting of coagulation-flocculation, filtration and disinfection; however, a variance from the treatment requirement may have been granted.

FIGURE 1

NORTH BAY WATER TREATMENT PLANT

SCHEMATIC DIAGRAM

CHARACTERISTICS

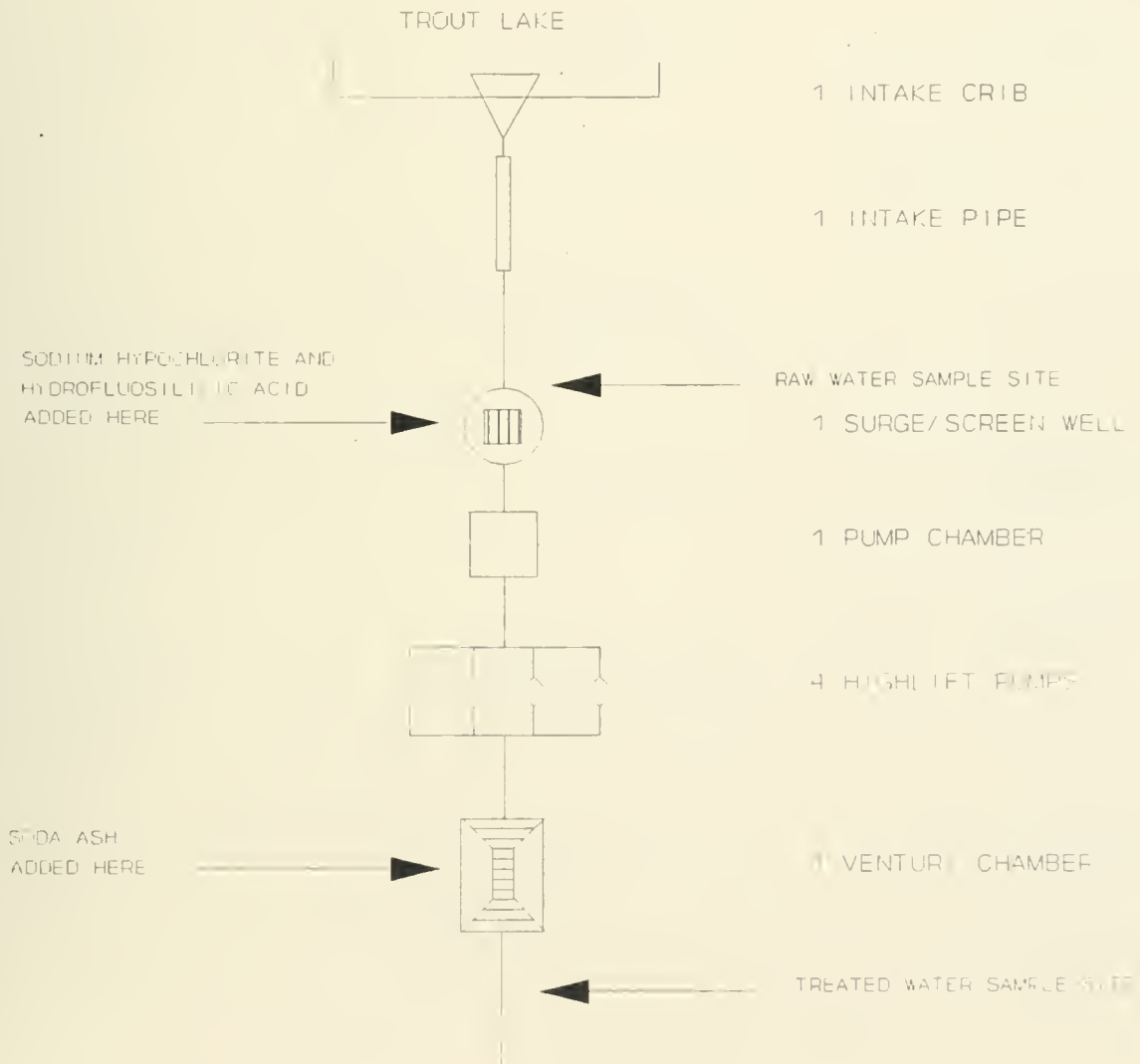


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

PLANT NAME: NORTH BAY WTP
WORKS #: 220000460
UTM #: 176225805131430

DISTRICT: NORTH BAY
REGION: NORTHEAST
DISTRICT MANAGER: G. MILLER

SUPERINTENDENT: BUD WINTON

ADDRESS: 248 LAKESIDE DR.
NORTH BAY, ONTARIO
P1B 3E3
705-474-3417

MUNICIPALITY: NORTH BAY
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	24.000	(X 1000 M3/DAY)
RATED CAPACITY:	22.500	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
NORTH BAY	50,000

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
FREE CHLORINE RESIDUAL	LAB TREATED TREATED	EVERY 8 HOURS CONTINUOUS
TOTAL CHLORINE RESIDUAL	LAB TREATED	EVERY 8 HOURS
FLUORIDE	TREATED	EVERY 8 HOURS
PH	TREATED	CONTINUOUS
TEMPERATURE	RAW	CONTINUOUS
TURBIDITY	RAW	CONTINUOUS

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	PRE CHLORINATION CHLORINE	FLUORIDATION HYDROFLUOSILICIC ACID	PH ADJUSTMENT SODIUM CARBONATE
91 FEB 26	.25	26.760	2.29	1.36	9.02
91 APR 23	.25	25.710	1.98	1.20	7.66
91 JUN 19	.25	47.656	1.63	1.23	8.13
91 AUG 20	.25	30.620	2.02	.93	7.54
91 OCT 29	.25	27.170	2.00	1.05	2.87
91 NOV 26	.25	25.310	1.93	1.23	6.17
92 MAR 24	.25	-	1.46	1.21	7.37
92 JUN 23	.25	28.980	1.76	1.30	9.31
92 SEP 29	.25	28.870	1.69	1.31	10.08
92 DEC 15	.25	28.350	1.00	1.30	3.75

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 2. Interim Maximum Acceptable Concentration (IMAC)
 3. Aesthetic Objective (AO)
 - 3*. AO for Total Xylenes
 4. Recommended Operational Guideline
 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!48	No Data: Sample Age Exceeded 48 Hours
!AR	No Data: No Numeric Results
!AW	No Data: Analysis Withdrawn
!BT	No Data: Sample Broken In Transit
!CS	No Data: Contamination Suspected
!EF	No Data: Laboratory Equipment Failure
!IR	No Data: Insufficient Sample
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedure Error: Sample Discarded
!PR	No Data: Preservative Required
!QU	No Data: Quality Control Unacceptable
!RE	No Data: Received Empty
!RO	No Data: No Numeric Results
!SM	No Data: Sample Missing
!SS	No Data: Sample Improperly Preserved
!U	No Data: Sample Unsuitable For Analysis
!UB	No Data: Bottle Broken
!UN	No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
BACTERIOLOGICAL					
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)	
1991 FEB	0	.	.	.	.
1991 APR	0	.	.	.	.
1991 JUN	0	.	.	.	.
1991 AUG	0 UAU	.	.	.	.
1991 OCT	3	.	.	.	.
1991 NOV	0	.	.	.	.
1992 MAR	0	.	.	.	.
1992 JUN	0	.	.	.	.
1992 SEP	1	.	.	.	.
1992 DEC	1	.	.	.	.
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0		GUIDELINE = 500 (A3)	
1991 FEB	.	4 <=>	.	53	2 <=>
1991 APR	.	8 <=>	.	12	12
1991 JUN	.	560	.	73	2 <=>
1991 AUG	.	9 <=>	.	190	.
1991 OCT	.	4 <=>	.	29	1 <=>
1991 NOV	.	6 <=>	.	42	3 <=>
1992 MAR	.	4 <=>	.	33	.
1992 JUN	.	3 <=>	.	.	4 <=>
1992 SEP	.	0 <=>	.	15	.
1992 DEC	.	6 <=>	.	.	0 <=>
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)	
1991 FEB	4	.	.	.	.
1991 APR	10	.	.	.	.
1991 JUN	BDL	.	.	.	.
1991 AUG	2 A3C	.	.	.	.
1991 OCT	30 A3C	.	.	.	.
1991 NOV	10	.	.	.	.
1992 MAR	4	.	.	.	.
1992 JUN	2	.	.	.	.
1992 SEP	4	.	.	.	.
1992 DEC	20	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
BACTERIOLOGICAL					
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = N/A	
1991 FEB	12	.	.	.	.
1991 APR	16	.	.	.	.
1991 JUN	82	.	.	.	.
1991 AUG	980 A3C	.	.	.	.
1991 OCT	1040 A3C	.	.	.	.
1991 NOV	116	.	.	.	.
1992 MAR	42	.	.	.	.
1992 JUN	44	.	.	.	.
1992 SEP	348	.	.	.	.
1992 DEC	128	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (FIELD)		DET'N LIMIT = 0		GUIDELINE = N/A		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
		FLD CHLORINE (COMB) (MG/L)	()	HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING
1991 FEB	.030			.050	.150	.000	.200						
1991 APR	.130			.050	.050	.050	.050						
1991 JUN	.100			.050	.050	.150	.000						
1991 AUG	.100			.000	.020	.050	.010						
1991 OCT	.080			.910	.000	.050	.060						
1991 NOV	.120			.060	.040	.060	.060						
1992 MAR	.070			.050	.	.080	1.150						
1992 JUN	.100			.	.050	.200	.080						
1992 SEP	.100			.	.	.	.						
1992 DEC	.100			.	.	.	.						
1991 FEB	.520			.350	.200	.300	.100						
1991 APR	.860			.150	.100	.200	.100						
1991 JUN	.370			.200	.100	.300	.100						
1991 AUG	.500			.100	.080	.	.						
1991 OCT	.440			.090	.030	.100	.090						
1991 NOV	.820			.090	.050	.090	.060						
1992 MAR	.480			.100	.	.320	.150						
1992 JUN	.320			.	.040	.	.						
1992 SEP	.100			.140	.	.100	.020						
1992 DEC	.600			.	.	.	.						
1991 FEB	.550			.400	.350	.300	.300						
1991 APR	.990			.200	.150	.250	.150						
1991 JUN	.470			.250	.150	.450	.100						
1991 AUG	.600			.100	.100	.	.						
1991 OCT	.520			1.000	.030	.150	.100						
1991 NOV	.940			.150	.090	.150	.120						
1992 MAR	.550			.150	.100	.400	.300						
1992 JUN	.420			.	.090	.	.						
1992 SEP	.200			.190	.	.300	.100						
1992 DEC	.700			.	.	.	.						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

FLO PH (DMNSLESS)		CHEMISTRY (FIELD)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1991 FEB	6.860	7.300	7.250	7.450	7.200	7.500	
1991 APR	6.970	7.150	7.250	7.200	7.450	7.450	
1991 JUN	6.910	7.390	7.250	7.200	7.450	7.400	
1991 AUG	6.920	7.200	7.400	7.350	.	.	
1991 OCT	7.200	7.340	7.250	7.200	7.400	7.400	
1991 NOV	7.000	7.220	7.500	7.450	7.500	7.500	
1992 MAR	6.820	7.120	7.300	7.100	.	.	
1992 JUN	6.690	7.110	.	.	7.250	7.200	
1992 SEP	6.900	7.000	7.210	7.200	.	.	
1992 DEC	7.080	7.310	.	.	7.360	7.360	
FLO TEMPERATURE (DEG.C)							
1991 FEB	3.300	3.300	5.000	15.000	8.000	14.000	
1991 APR	3.300	3.300	5.400	14.000	8.400	19.400	
1991 JUN	6.600	10.000	11.000	20.000	14.000	23.000	
1991 AUG	7.200	7.200	13.700	19.600	.	.	
1991 OCT	8.300	9.000	11.000	19.000	13.000	16.000	
1991 NOV	5.500	5.500	10.000	17.000	11.000	16.000	
1992 MAR	2.700	2.700	6.700	14.700	.	.	
1992 JUN	5.000	5.000	13.000	16.000	.	7.000	
1992 SEP	6.100	6.500	.	.	6.000	.	
1992 DEC	2.200	2.200	.	.	.	17.000	
FLO TURBIDITY (FTU)							
1991 FEB	.560	.560	.	.	.	.	
1991 APR	.650	.650	.	.	.	.	
1991 JUN	.550	.550	.	.	.	.	
1991 AUG	.570	.570	.	.	.	.	
1991 OCT	.720	.720	.	.	.	.	
1991 NOV	.540	.540	.	.	.	.	
1992 MAR	.430	.430	.	.	.	.	
1992 JUN	.500	.500	.	.	.	.	
1992 SEP	.450	.500	.	.	.	.	
1992 DEC	.460	.460	.	.	.	.	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHEMISTRY (LABORATORY)					
ALKALINITY (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A4)	
1991 FEB	13.600	20.300	20.800	21.400	23.200
1991 APR	12.200	18.400	17.400	17.100	22.000
1991 JUN	12.700	21.200	19.100	19.900	20.300
1991 AUG	13.100	19.800	20.500	21.400	.
1991 OCT	13.000	14.500	14.900	14.900	15.400
1991 NOV	13.200	17.100	17.500	17.000	17.100
1992 MAR	13.900	19.600	20.700	21.200	.
1992 JUN	11.700	20.000	.	21.700	19.800
1992 SEP	12.800	21.100	22.100	.	.
1992 DEC	13.200	14.900	.	15.400	15.500
CALCIUM (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 100 (F2)	
1991 FEB	6.300	6.100	6.400	6.700	6.200
1991 APR	7.200	7.200	8.000	7.400	7.400
1991 JUN	6.400	6.400	7.000	6.800	7.000
1991 AUG	6.800	6.600	7.200	6.800	.
1991 OCT	6.200	6.400	6.200	6.200	6.700
1991 NOV	6.300	6.100	6.000	6.100	6.200
1992 MAR	6.350	6.200	6.400	6.550	.
1992 JUN	5.600	5.850	.	5.950	5.800
1992 SEP	5.700	5.700	6.050	.	.
1992 DEC	5.750	5.700	.	5.950	6.000
CYANIDE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 0.2 (A1)	
16 SAMPLES	BDL	BDL	.	.	.
CHLORIDE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 250 (A3)	
1991 FEB	16.500	17.600	17.500	17.500	17.500
1991 APR	16.100	16.600	17.300	17.200	17.000
1991 JUN	12.700	14.000	14.300	14.700	14.200
1991 AUG	13.300	14.500	14.700	14.700	.
1991 OCT	13.700	15.100	15.400	15.400	15.100
1991 NOV	13.700	15.300	15.500	15.500	15.000
1992 MAR	18.600	19.800	20.000	20.200	.
1992 JUN	15.000	15.600	.	15.500	15.500
1992 SEP	13.600	15.000	13.600	14.300	.
1992 DEC	14.400	15.800	.	15.800	16.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST		DIST. SYSTEM GORMAN ST STANDING	
CHEMISTRY (LABORATORY)										
COLOUR (HZU)			DET'N LIMIT = 0.50		GUIDELINE = 5 (A3)					
1991 FEB	8.500	5.000	6.500	7.000	6.000	6.000	6.000	6.000	6.000	
1991 APR	5.000	4.000	7.000	7.500	7.000	7.000	7.000	5.000	5.000	
1991 JUN	8.500	6.000	7.000	7.500	6.500	6.500	6.500	7.000	7.000	
1991 AUG	8.000	5.500	6.500	6.000	6.000	6.000	6.000	11.000	11.000	
1991 OCT	10.000	5.000	8.000	6.000	6.000	6.000	6.000	6.000	6.000	
1991 NOV	7.500	5.000	7.500	6.000	6.000	6.000	6.000	5.500	5.500	
1992 MAR	7.500	4.500	8.500	7.000	6.000	6.000	6.000	6.000	6.000	
1992 JUN	8.000	5.500	6.000	6.000	6.000	6.000	6.000	6.000	6.000	
1992 SEP	8.000	5.500	6.000	6.000	6.000	6.000	6.000	6.000	6.000	
1992 DEC	7.000	5.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	
CONDUCTIVITY (UMHO/CM)										
			DET'N LIMIT = 1.0		GUIDELINE = 400 (F2)					
1991 FEB	112	134	133	135	132	138	138	138	138	
1991 APR	108	124	123	123	127	129	129	129	129	
1991 JUN	94	117	115	118	115	117	117	117	117	
1991 AUG	92	112	115	116	116	110	110	110	110	
1991 OCT	97	108	109	110	113	113	113	113	113	
1991 NOV	97	112	114	115	115	115	115	115	115	
1992 MAR	117	139	140	143	120	121	121	121	121	
1992 JUN	97	120	122	122	112	112	112	112	112	
1992 SEP	95	120	122	122	112	112	112	112	112	
1992 DEC	97	111	122	122	112	112	112	112	112	
DISS ORG CARBON (MG/L)										
			DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)					
1991 FEB	3.200	3.100	3.300	2.900	3.200	3.100	3.100	3.100	3.100	
1991 APR	3.200	3.200	3.000	3.000	3.100	3.100	3.100	3.100	3.100	
1991 JUN	3.000	2.900	2.900	3.500	3.000	3.000	3.000	3.000	3.000	
1991 AUG	2.700	2.900	2.800	2.900	2.900	2.800	2.800	2.800	2.800	
1991 OCT	3.100	3.200	2.700	2.900	2.900	2.900	2.900	2.800	2.800	
1991 NOV	3.300	3.200	3.000	2.800	3.100	3.100	3.100	3.100	3.100	
1992 MAR	2.900	2.800	2.800	2.800	3.000	3.000	3.000	2.800	2.800	
1992 JUN	2.900	2.800	2.600	2.800	3.000	3.000	3.000	2.800	2.800	
1992 SEP	2.800	2.900	2.600	2.800	3.100	3.100	3.100	3.100	3.100	
1992 DEC	3.000	3.100	2.600	2.800	3.100	3.100	3.100	3.100	3.100	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHEMISTRY (LABORATORY)						
FLUORIDE (MG/L)			DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 FEB	.100	1.340	1.280	1.300	1.280	1.280
1991 APR	.460	1.120	1.160	1.160	1.100	1.240
1991 JUN	.060	1.140	1.160	1.180	1.080	1.160
1991 AUG	.060	.860	.900	.900	.	.
1991 OCT	.060	.980	.980	1.000	1.000	1.000
1991 NOV	.080	1.040	1.080	1.080	1.080	1.080
1992 MAR	.080	1.260	1.220	1.240	.	.
1992 JUN	.060	1.240	.	1.120	1.320	1.320
1992 SEP	.080	1.080	1.140	.	.	1.280
1992 DEC	.060	1.140	.	.	1.220	.
HARDNESS (MG/L)						
			DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 FEB	23.100	22.200	22.800	23.400	23.300	22.500
1991 APR	26.000	26.000	28.000	27.000	27.000	26.000
1991 JUN	24.000	23.000	24.000	25.000	24.000	25.000
1991 AUG	24.000	23.000	24.000	23.000	.	.
1991 OCT	22.400	22.800	21.900	22.200	22.700	23.200
1991 NOV	23.200	22.500	22.400	22.600	22.400	22.600
1992 MAR	23.000	23.000	23.000	24.000	.	.
1992 JUN	21.000	21.000	.	21.620	22.000	21.000
1992 SEP	21.120	21.630	21.910	.	.	.
1992 DEC	21.210	21.160	.	.	21.640	21.860
IONCAL (DMNSLESS)						
			DET'N LIMIT = N/A		GUIDELINE = N/A	
1991 FEB	1.806	4.563	4.109	4.199	1.946	4.896
1991 APR	10.770 NAF	11.640 NAF	16.500 NAF	13.210 NAF	14.610 NAF	9.127 NAF
1991 JUN	6.211 NAF	9.773 NAF	9.457 NAF	10.830 NAF	7.512 NAF	9.208 NAF
1991 AUG	1.315	3.256	5.369 R10	1.262 R10	.	.
1991 OCT	6.028	15.100	11.570	12.760	12.230	12.420
1991 NOV	.805	3.333	2.458	.373	5.087	6.313
1992 MAR	.245 NAF	4.459 NAF	2.242 NAF	3.331 NAF	.	.
1992 JUN	4.176	4.588	.	9.321	5.033	3.277
1992 SEP	1.792	6.937	10.570	.	.	.
1992 DEC	3.621	2.368	.	.	3.188	1.968

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	CHEMISTRY (LABORATORY)		OET'N LIMIT = 0.01		GUIDELINE = 10 (F2)		DIST. SYSTEM		DIST. SYSTEM	
	POTASSIUM (MG/L)		TREATMENT PLANT TREATED	HERMAN CR FREE FLOW	HERMAN CR STANDING	FREE FLOW	STANDING	HERMAN CR FREE FLOW	STANDING	HERMAN CR STANDING
1991 FEB	1.260	1.250	1.240	1.270	1.330	1.290				
1991 APR	1.300	1.250	1.300	1.250	1.250	1.300				
1991 JUN	1.150	1.050	.850	1.050	.600	.800				
1991 AUG	1.300	1.250	1.300	1.400						
1991 OCT	1.250	1.290	1.270	1.330	1.260	1.250				
1991 NOV	1.250	1.220	1.230	1.340	1.220	1.210				
1992 MAR	1.470	1.330	1.330	1.440						
1992 JUN	1.220	1.210		1.178	1.220	1.200				
1992 SEP	1.157	1.173	1.171							
1992 DEC	1.170	1.184			1.187	1.182				

LANGELIERS INDEX (DMMSLESS)	OET'N LIMIT = N/A		GUIDELINE = N/A		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
1991 FEB	-2.120	-1.740	-1.698	-1.657	-1.747	-1.557				
1991 APR	-2.207	-1.776	-1.794	-1.816	-1.710	-1.659				
1991 JUN	-2.075	-1.623	-1.708	-1.714	-1.677	-1.623				
1991 AUG	-2.234	-1.817	-1.695 RID	-1.752 RID						
1991 OCT	-2.150	-1.954	-2.016	-2.018	-1.985	-1.968				
1991 NOV	-2.026	-1.785	-1.793	-1.796	-1.758	-1.798				
1992 MAR	-1.919 NAF	-1.651 NAF	-1.613 NAF	-1.594 NAF						
1992 JUN	-2.120	-1.667		-1.715	-1.717	-1.717				
1992 SEP	-2.112	-1.645	-1.601	-1.626						
1992 DEC	-2.166	-2.103		-2.141	-2.145	-2.145				

MAGNESIUM (MG/L)	OET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
1991 FEB	1.750	1.700	1.650	1.650	1.700	1.700				
1991 APR	1.900	1.900	2.100	2.000	1.900	1.800				
1991 JUN	1.900	1.800	1.600	1.900	1.700	1.800				
1991 AUG	1.600	1.600	1.500	1.400						
1991 OCT	1.700	1.650	1.550	1.600	1.550	1.600				
1991 NOV	1.850	1.800	1.800	1.750	1.730	1.750				
1992 MAR	1.850	1.830	1.790	1.820						
1992 JUN	1.660	1.660		1.650	1.650	1.650				
1992 SEP	1.660	1.700	1.640							
1992 DEC	1.670	1.670			1.660	1.670				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHEMISTRY (LABORATORY)					
SODIUM (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)	
1991 FEB	9.900	15.300	15.400	14.300	14.300
1991 APR	10.200	13.800	13.800	15.400	15.600
1991 JUN	7.800	12.800	13.400	12.800	13.000
1991 AUG	8.000	12.800	13.000	.	.
1991 OCT	8.700	12.000	12.100	11.700	11.800
1991 NOV	8.000	11.900	11.900	12.000	12.100
1992 MAR	11.700	16.500	16.900	.	.
1992 JUN	8.560	.	.	14.300	14.300
1992 SEP	8.390	14.890	14.890	.	.
1992 DEC	8.470	.	.	11.570	11.530
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
1991 FEB	.008 <T	.002 <T	.002 <T	.004 <T	.002 <T
1991 APR	.006 <T	.004 <T	.012	.010	.010
1991 JUN	.016	BDL	.014	.004 <T	.008 <T
1991 AUG	BDL	.002 <T	BDL	.	.
1991 OCT	.008 <T	BDL	.014	.002 <T	.010
1991 NOV	.010	.006 <T	.010	.006 <T	.006 <T
1992 MAR	.008 <T	.008 <T	.020	.	.
1992 JUN	.004 <T	BDL	.010	.006 <T	.004 <T
1992 SEP	.004 <T	.002 <T	.	.002 <T	.
1992 DEC	.010	.002 <T	.	.	.004 <T
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)	
1991 FEB	.002 <T	BDL	.001 <T	BDL	BDL
1991 APR	.001 <T	BDL	.001 <T	BDL	BDL
1991 JUN	.002 <T	.001 <T	.001 <T	.001 <T	.002 <T
1991 AUG	BDL	.001 <T	.001 <T	.	.
1991 OCT	.003 <T	.001 <T	.002 <T	.002 <T	.002 <T
1991 NOV	.002 <T	.002 <T	.002 <T	.002 <T	.001 <T
1992 MAR	.003 <T	.004 <T	.005	.	.
1992 JUN	.003 <T	.002 <T	.002 <T	.003 <T	.002 <T
1992 SEP	.002 <T	.001 <T	.	.	.
1992 DEC	.002 <T	.001 <T	.	BDL	.001 <T

TABLE 4
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TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHEMISTRY (LABORATORY)					
NITRATE (TOTAL) (MG/L)		DET'N LIMIT = 0.005		GUIDELINE = 10.0 (A1)	
1991 FEB	.280	.280	.285	.285	.285
1991 APR	.330	.325	.325	.335	.345
1991 JUN	.275	.270	.285	.270	.275
1991 AUG	.305	.290	.310	.	.
1991 OCT	.185	.175	.215	.185	.180
1991 NOV	.210	.195	.205	.200	.210
1992 MAR	.290	.290	.300	.285	.415
1992 JUN	.260	.	.260	.	.
1992 SEP	.265	.	.	.155	.160
1992 DEC	.165	.	.	.	.
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02		GUIDELINE = N/A	
1991 FEB	.220	.230	.240	.220	.200
1991 APR	.210	.210	.200	.200	.190
1991 JUN	.190	.220	.280	.230	.210
1991 AUG	.130	.130	.140	.	.
1991 OCT	.180	.210	.260	.140	.210
1991 NOV	.230	.210	.210	.210	.210
1992 MAR	.200	.180	.200	.180	.180
1992 JUN	.180	.170	.	.	.
1992 SEP	.210	.190	.180	.240	.200
1992 DEC	.220	.210	.	.	.
PH (DMNSLESS)					
		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1991 FEB	7.310	7.540	7.560	7.500	7.660
1991 APR	7.210	7.470	7.450	7.480	7.500
1991 JUN	7.370	7.610	7.520	7.580	7.590
1991 AUG	7.170	7.430	7.450	.	.
1991 OCT	7.300	7.440	7.370	7.390	7.380
1991 NOV	7.410	7.560	7.520	7.590	7.540
1992 MAR	7.500	7.640	7.640	.	.
1992 JUN	7.420	7.650	.	7.580	7.590
1992 SEP	7.380	7.630	7.630	.	.
1992 DEC	7.310	7.330	.	7.260	7.250

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHEMISTRY (LABORATORY)					
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005		GUIDELINE = N/A	
1991 FEB	BOL	.001 <T	.	.	.
1991 APR	.002	.003	.	.	.
1991 JUN	BOL	.002 <T	.	.	.
1991 AUG	BOL	.002 <T	.	.	.
1991 OCT	.000 <T	.001 <T	.	.	.
1991 NOV	BOL	.001 <T	.	.	.
1992 MAR	BOL	.002 <T	.	.	.
1992 JUN	BOL	.001 <T	.	.	.
1992 SEP	BOL	.002 <T	.	.	.
1992 DEC	BOL	.002 <T	.	.	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.40 (F2)	
1991 FEB	.003 <T	.005 <T	.	.	.
1991 APR	.006 <T	.008 <T	.	.	.
1991 JUN	.003 <T	.005 <T	.	.	.
1991 AUG	.002 <T	BOL	.	.	.
1991 OCT	BOL	.004 <T	.	.	.
1991 NOV	.004 <T	.002 <T	.	.	.
1992 MAR	.006 <T	.012	.	.	.
1992 JUN	.004 <T	.004 <T	.	.	.
1992 SEP	.003 <T	.003 <T	.	.	.
1992 DEC	.005 <T	.006 <T	.	.	.
RESIDUE FILTRATE (MG/L)		DET'N LIMIT = N/A		GUIDELINE = 500 (A3)	
1991 FEB	73.000 CRO	87.200 CRO	86.600 CRO	87.800 CRO	89.800 CRO
1991 APR	70.200 CRO	80.800 CRO	80.200 CRO	80.000 CRO	82.200 CRO
1991 JUN	61.400 CRO	76.200 CRO	75.000 CRO	77.000 CRO	84.000 CRO
1991 AUG	60.000 CRO	72.800 CRO	74.800 CRO	75.400 CRO	76.000 CRO
1991 OCT	63.000 CRO	70.400 CRO	70.800 CRO	71.400 CRO	71.200 CRO
1991 NOV	63.000 CRO	73.200 CRO	74.000 CRO	75.000 CRO	73.200 CRO
1992 MAR	76.000 CRO	90.400 CRO	91.000 CRO	93.000 CRO	.
1992 JUN	62.800 CRO	78.000 CRO	79.600 CRO	77.800 CRO	78.600 CRO
1992 SEP	61.400 CRO	78.000 CRO	.	72.600	73.000
1992 DEC	63.000	72.000	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR		DIST. SYSTEM HERMAN CR		DIST. SYSTEM GORMAN ST		DIST. SYSTEM GORMAN ST STANDING
		FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	
CHEMISTRY (LABORATORY)								
SULPHATE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)				
1991 FEB	8.700	8.750	8.530	8.810	8.690	8.670	8.670	
1991 APR	8.400	8.510	8.480	8.670	8.730	8.790	8.790	
1991 JUN	7.890	7.670	7.870	7.940	7.870	7.990	7.990	
1991 AUG	8.760	8.340	8.300	8.550				
1991 OCT	7.290	6.820	6.930	6.500	7.240	7.370	7.370	
1991 NOV	8.410	8.300	8.260	8.620	8.110	8.210	8.210	
1992 MAR	9.380	9.290	9.300	9.340				
1992 JUN	8.450	8.450	7.890	7.710	8.680	8.700	8.700	
1992 SEP	8.260	7.730			8.300		8.530	
1992 DEC	8.230	8.350						
TURBIDITY (FTU)		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)				
1991 FEB	.610	.610	.760	.710	.890	.850		
1991 APR	.480	.540	.550	.650	1.030 RRV	.720		
1991 JUN	.390	.470	.530	.590	.450	.530		
1991 AUG	.430	.510	.600	.810				
1991 OCT	.540	.440	.580	.620	.510	.670	.670	
1991 NOV	.700	.510	.640	.620	.680	.640	.640	
1992 MAR	.420	.330	.470	.510	.520	.560	.560	
1992 JUN	.440	.410	.710	.630				
1992 SEP	.630	.560						
1992 DEC	.810	.710			.960	.940	.940	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
METALS											
SILVER (UG/L)		DET'N LIMIT = 0.05 GUIDELINE = N/A									
49 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)		DET'N LIMIT = 0.10 GUIDELINE = 100 (A4)									
1991 FEB	14.000	15.000	13.000 SIL	12.000 SIL	15.000 WSD	15.000 WSD		15.000 WSD		15.000 WSD	
1991 APR	30.000	31.000	ISM	19.000	31.000	31.000		25.000		25.000	
1991 JUN	17.000	17.000	44.000	21.000	19.000	19.000		19.000		19.000	
1991 AUG	13.000	14.000	14.000	17.000							
1991 OCT	15.000	15.000	15.000	15.000	14.000			15.000		15.000	
1991 NOV	15.000	14.000	15.000	16.000	16.000			16.000		16.000	
1992 MAR	15.000	14.000	14.000	12.000							
1992 JUN	28.000	19.000			19.000			18.000		18.000	
1992 SEP	11.000	12.000	11.000			24.000				20.000	
1992 DEC	20.000	25.000									
ARSENIC (UG/L)		DET'N LIMIT = 0.10 GUIDELINE = 25 (A1)									
1991 FEB	.140 <T	.430 <T	.310 <T	.340 <T	.410 <T	.300 <T					
1991 APR	BDL	BDL	ISM	BDL	.130 <T	BDL		BDL		BDL	
1991 JUN	.120 <T	.450 <T	.450 <T	.570 <T	.440 <T	.460 <T					
1991 AUG	.130 <T	.450 <T	.400 <T	.310 <T							
1991 OCT	.200 <T	.180 <T	.250 <T	.170 <T	.150 <T	.360 <T					
1991 NOV	.170 <T	.470 <T	.470 <T	.290 <T	.420 <T	.480 <T					
1992 MAR	.400 <T	.620 <T	.450 <T	.590 <T							
1992 JUN	.280 <T	.540 <T		.690 <T	.570 <T	.430 <T					
1992 SEP	.280 <T	.590 <T	.560 <T		.530 <T	.390 <T					
1992 DEC	.110 <T	.290 <T									
BARIUM (UG/L)		DET'N LIMIT = 0.05 GUIDELINE = 1000 (A2)									
1991 FEB	16.000	16.000	16.000 SIL	17.000 SIL	16.000 WSD	17.000 WSD		17.000 WSD		17.000 WSD	
1991 APR	17.000	17.000	ISM	18.000	16.000	16.000		14.000		14.000	
1991 JUN	14.000	14.000	15.000	16.000	16.000	14.000				15.000	
1991 AUG	14.000	14.000	16.000	16.000							
1991 OCT	15.000	15.000	14.000	15.000	14.000	14.000		14.000		14.000	
1991 NOV	17.000	15.000	13.000	14.000	14.000	14.000		14.000		14.000	
1992 MAR	19.000	19.000	17.000	19.000							
1992 JUN	18.000	16.000		13.000	15.000	15.000		17.000		17.000	
1992 SEP	13.000	14.000									
1992 DEC	15.000	17.000									

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
METALS					
BORON (UG/L)		DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)	
1991 FEB	8,000 <T	7,800 <T	7,400 <T	7,000 <T	7,300 <T
1991 APR	9,000 <T	8,700 <T	8,000 <T	8,000 <T	7,400 <T
1991 JUN	13,000 <T	8,900 <T	7,400 <T	9,400 <T	7,400 <T
1991 AUG	8,100 <T	8,700 <T	6,900 <T	8,500 <T	7,400 <T
1991 OCT	12,000 <T	10,000 <T	8,500 <T	8,900 <T	8,500 <T
1991 NOV	9,200 <T	7,200 <T	7,900 <T	8,400 <T	7,400 <T
1992 MAR	8,500 <T	8,100 <T	8,400 <T	8,300 <T	8,300 <T
1992 JUN	10,000 <T	7,800 <T	7,300 <T	6,600 <T	7,500 <T
1992 SEP	6,900 <T	7,500 <T	7,500 <T	7,800 <T	7,600 <T
1992 DEC	10,000 <T	7,600 <T	7,600 <T	7,800 <T	7,600 <T
BERYLLIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
CADMIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

METALS											
COBALT (UG/L)											
TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
DET'N LIMIT = 0.02											
GUIDELINE = N/A											
1991 FEB	.130 <T	.130 <T	.140 <T	.120 <T	.120 <T	1.600 WSD		.480 <T			
1991 APR	.580 <T	.170 <T	ISM	.280 <T	.280 <T	.180 <T		.190 <T			
1991 JUN	.220 <T	.330 <T	.120 <T	.460 <T	.460 <T	.120 <T		.150 <T			
1991 AUG	.150 <T	.120 <T	.490 <T	.270 <T	.270 <T						
1991 OCT	2.100	.180 <T	.290 <T	.350 <T	.350 <T	.140 <T		.350 <T			
1991 NOV	.360 <T	.270 <T	.160 <T	.300 <T	.300 <T	.200 <T		.880 <T			
1992 MAR	1.100	1.300	.560 <T	.170 <T	.170 <T						
1992 JUN	25.000	1.300				.210 <T		.190 <T			
1992 SEP	.120 <T	.120 <T	.220 <T	.110 <T	.110 <T						
1992 DEC	.110 <T	.600 <T			.680 <T			.110 <T			
CHROMIUM (UG/L)											
DET'N LIMIT = 0.50											
GUIDELINE = 50.0 (A1)											
1991 FEB	3.500 <T	5.000 <T	3.200 <T	3.400 <T	3.400 <T	4.200 <T		3.500 <T			
1991 APR	1.500 <T	6.100	ISM	1.600 <T	1.600 <T	1.400 <T		1.600 <T			
1991 JUN	5.100	4.600 <T	4.900 <T	4.700 <T	4.700 <T	4.900 <T		5.800			
1991 AUG	4.100 <T	6.500	4.400 <T	5.400	5.400						
1991 OCT	2.000 <T	4.900 <T	5.000 <T	4.700 <T	4.700 <T	3.900 <T		4.300 <T			
1991 NOV	1.700 <T	.980 <T	2.200 <T	2.500 <T	2.500 <T	3.900 <T		4.100 <T			
1992 MAR	2.600 <T	2.700 <T	4.100 <T	4.600 <T	4.600 <T						
1992 JUN	7.600	1.700 <T				1.300 <T		1.400 <T			
1992 SEP	2.000 <T	2.600 <T	1.600 <T	1.900 <T	1.900 <T						
1992 DEC	2.300 <T	4.700 <T				2.700 <T		2.500 <T			
COPPER (UG/L)											
DET'N LIMIT = 0.50											
GUIDELINE = 1000 (A3)											
1991 FEB	2.700 <T	2.900 <T	28.000 SIL	230.000 SIL	230.000 SIL	73.000 WSD		260.000 WSD			
1991 APR	2.700 <T	2.700 <T	ISM	740.000	740.000	170.000		250.000			
1991 JUN	2.000 <T	2.000 <T	44.000	180.000	180.000	64.000		250.000			
1991 AUG	1.700 <T	3.300 <T	35.000	200.000	200.000						
1991 OCT	2.900 <T	3.100 <T	67.000	200.000	200.000	120.000		110.000			
1991 NOV	2.900 <T	2.800 <T	40.000	390.000	390.000	140.000		140.000			
1992 MAR	4.900 <T	4.800 <T	49.000	420.000	420.000						
1992 JUN	3.100 <T	2.800 <T				100.000		420.000			
1992 SEP	2.100 <T	2.200 <T	56.000	87.000	87.000						
1992 DEC	2.600 <T	2.800 <T				170.000		310.000			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
METALS											
IRON (UG/L)		DET'N LIMIT = 6.00				GUIDELINE = 300 (A3)					
1991 FEB	51,000 <T	57,000 <T	93,000 SIL	91,000 SIL	64,000 WSD	68,000 WSD					
1991 APR	62,000	74,000	ISM	180,000	81,000	62,000					
1991 JUN	55,000 <T	71,000	120,000	140,000	50,000 <T	54,000 <T					
1991 AUG	30,000 <T	53,000 <T	130,000	98,000							
1991 OCT	54,000 <T	78,000	150,000	150,000	50,000 <T	64,000					
1991 NOV	33,000 <T	48,000 <T	160,000	110,000	49,000 <T	51,000 <T					
1992 MAR	77,000	72,000	240,000	190,000							
1992 JUN	92,000	57,000 <T		85,000	42,000 <T	44,000 <T					
1992 SEP	27,000 <T	43,000 <T	84,000		60,000 <T	51,000 <T					
1992 DEC	49,000 <T	60,000 <T									
MERCURY (UG/L)		DET'N LIMIT = 0.02				GUIDELINE = 1.0 (A1)					
20 SAMPLES		BOL		BOL							
MANGANESE (UG/L)											
		DET'N LIMIT = 0.05				GUIDELINE = 50.0 (A3)					
1991 FEB	6,900	6,800	8,600 SIL	8,100 SIL	6,200 WSD	6,400 WSD					
1991 APR	7,800	7,700	ISM	11,000	7,400	5,700					
1991 JUN	4,300	5,800	7,800	8,000	5,800	5,500					
1991 AUG	3,700	5,300	13,000	12,000							
1991 OCT	5,300	6,100	11,000	11,000	4,400	5,100					
1991 NOV	5,600	6,000	11,000	9,200	6,000	5,800					
1992 MAR	10,000	9,300	13,000	11,000							
1992 JUN	19,000	9,600		12,000	8,400	8,700					
1992 SEP	5,300	7,200			10,000	9,300					
1992 DEC	8,700	9,100									
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05				GUIDELINE = N/A					
1991 FEB	.110 <T	.110 <T	.070 <T	BOL	.080 <T	.100 <T					
1991 APR	.120 <T	.140 <T	ISM	.060 <T	.060 <T	.100 <T					
1991 JUN	.160 <T	.090 <T	.460 <T	.110 <T	.080 <T	.130 <T					
1991 AUG	.150 <T	.140 <T	.060 <T	.070 <T							
1991 OCT	.240 <T	.110 <T	.120 <T	.110 <T	.190 <T	.090 <T					
1991 NOV	.190 <T	.090 <T	.090 <T	.130 <T	.100 <T	.130 <T					
1992 MAR	.150 <T	.140 <T	.110 <T	.140 <T							
1992 JUN	.080 <T	.060 <T			.110 <T	BOL					
1992 SEP	BOL	BOL		BOL							
1992 DEC	.220 <T	.330 <T			.140 <T	.120 <T					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
METALS					
NICKEL (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (03)		
1991 FEB	1.300 <T	1.100 <T	2.400 SIL	1.100 <T	.950 <T
1991 APR	1.100 <T	1.500 <T	26.000	.800 <T	.910 <T
1991 JUN	1.200 <T	1.500 <T	3.900	1.300 <T	1.300 <T
1991 AUG	1.400 <T	1.500 <T	5.600	.	.
1991 OCT	1.000 <T	1.600 <T	2.500	1.300 <T	1.400 <T
1991 NOV	1.000 <T	1.000 <T	2.900	1.200 <T	1.300 <T
1992 MAR	1.400 <T	1.200 <T	2.300	.	.
1992 JUN	2.500	.	.	1.200 <T	.850 <T
1992 SEP	.670 <T	.930 <T	.950 <T	.	.
1992 DEC	1.200 <T	1.800 <T	.	1.200 <T	1.300 <T
LEAD (UG/L)					
		DET'N LIMIT = 0.05	GUIDELINE = 10 (A1)		
1991 FEB	.180 <T	1.500 SIL	20.000 SIL	.410 <T	1.400 WSD
1991 APR	.390 <T	ISM	460.000	.690	4.900
1991 JUN	.220 <T	3.500	39.000	.450 <T	2.900
1991 AUG	BOL	1.800	27.000	.	.
1991 OCT	.140 <T	.090 <T	26.000	.660	.950
1991 NOV	.110 <T	2.300	28.000	.470 <T	.540
1992 MAR	.260 <T	3.400	52.000	.	1.400
1992 JUN	.590	.	.	.620	.
1992 SEP	BOL	2.300	5.100	.	2.000
1992 DEC	.110 <T	.	.	.530	.
ANTIMONY (UG/L)					
		DET'N LIMIT = 0.05	GUIDELINE = 146 (04)		
1991 FEB	.510	.550 SIL	.460 <T	2.100 WSD	.820 WSD
1991 APR	1.300	ISM	.800	.600	.750
1991 JUN	.890	.680	1.200	.590	.740
1991 AUG	.490 <T	.970	.580	.	.
1991 OCT	1.100	.400 <T	.880	.700	1.000
1991 NOV	.710	.440 <T	.730	.450 <T	1.100
1992 MAR	2.800	1.100	.500 <T	.	.
1992 JUN	30.000	.	.	.420 <T	.430 <T
1992 SEP	.400 <T	.440 <T	.420 <T	.	.
1992 DEC	.370 <T	1.100	.	1.800	.500 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	TREATMENT PLANT	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
METALS							
SELENIUM (UG/L)		DET'N LIMIT = 1.00			GUIDELINE = 10 (A1)		
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	ISM	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
STRONTIUM (UG/L)		DET'N LIMIT = 0.10			GUIDELINE = N/A		
1991 FEB	47.000	47.000	48.000 SIL	48.000 SIL	48.000 WSD	48.000 WSD	50.000 WSD
1991 APR	44.000	44.000	ISM	47.000	44.000	44.000	44.000
1991 JUN	40.000	41.000	44.000	45.000	43.000	43.000	43.000
1991 AUG	40.000	39.000	42.000	42.000	42.000	42.000	42.000
1991 OCT	44.000	45.000	44.000	44.000	41.000	41.000	45.000
1991 NOV	47.000	44.000	43.000	46.000	44.000	44.000	44.000
1992 MAR	50.000	50.000	49.000	50.000	46.000	46.000	48.000
1992 JUN	51.000	49.000	44.000	43.000	50.000	50.000	48.000
1992 SEP	41.000	44.000	48.000	48.000	48.000	48.000	48.000
1992 DEC	47.000	48.000	48.000	48.000	48.000	48.000	48.000
TITANIUM (UG/L)		DET'N LIMIT = 0.50			GUIDELINE = N/A		
1991 FEB	2.200 <T	3.200 <T	2.900 <T	3.000 <T	2.800 <T	2.800 <T	3.200 <T
1991 APR	5.300	6.100	ISM	6.100	6.500	6.500	6.200
1991 JUN	2.900 <T	3.300 <T	3.400 <T	3.700 <T	3.600 <T	3.600 <T	3.400 <T
1991 AUG	.630 <T	.800 <T	.800 <T	.840 <T	2.200 <T	2.200 <T	2.300 <T
1991 OCT	1.800 <T	2.400 <T	2.400 <T	2.300 <T	1.900 <T	1.900 <T	1.900 <T
1991 NOV	1.400 <T	1.700 <T	1.600 <T	1.600 <T	3.900 <T	3.900 <T	4.200 <T
1992 MAR	2.500 <T	2.400 <T	2.000 <T	2.300 <T	1.800 <T	1.800 <T	1.700 <T
1992 JUN	6.000	4.300 <T	2.800 <T	2.600 <T	1.800 <T	1.800 <T	1.700 <T
1992 SEP	2.400 <T	2.700 <T	2.400 <T	2.400 <T	1.800 <T	1.800 <T	1.700 <T
1992 DEC	1.800 <T	1.900 <T	1.900 <T	1.900 <T	1.800 <T	1.800 <T	1.700 <T

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
METALS					
THALLIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 13 (D4)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	ISM	.130 <T	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	.	.
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	.070 <T	.060 <T	.	.
1992 JUN	.080 <T	.	.	BDL	BDL
1992 SEP	BDL	BDL	BDL	.	.
1992 DEC	BDL	.	.	BDL	BDL
URANIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	ISM	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	.	.
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	.	.
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	.	.	.
1992 DEC	.110 <T	.090 <T	.	BDL	.070 <T
VANADIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 FEB	.120 <T	BDL	BDL	BDL	BDL
1991 APR	BDL	ISM	BDL	.120 <T	.130 <T
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	.070 <T	.080 <T	.	.
1991 OCT	.130 <T	BDL	.090 <T	.110 <T	BDL
1991 NOV	BDL	BDL	.080 <T	BDL	BDL
1992 MAR	BDL	BDL	BDL	.	.
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	.	.	.
1992 DEC	.100 <T	.180 <T	.	.130 <T	.090 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
METALS					
ZINC (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)		
1991 FEB	11.000	9.300 SIL	33.000 SIL	9.800 WSD	13.000 WSD
1991 APR	11.000	ISM	460.000	11.000	20.000
1991 JUN	10.000	19.000	36.000	10.000	17.000
1991 AUG	8.000	11.000	22.000	.	.
1991 OCT	7.800	9.600	29.000	7.800	9.300
1991 NOV	7.700	5.700	30.000	6.100	6.200
1992 MAR	10.000	9.100	34.000	.	.
1992 JUN	19.000	10.000	12.000	11.000	13.000
1992 SEP	9.000	.	.	.	.
1992 DEC	9.600	.	.	9.900	14.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHLOROAROMATICS					
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (D4)	
31 SAMPLES	BDL	BDL	.	BDL	.
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.
1234-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.
1235-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (1)	
31 SAMPLES	BDL	BDL	.	BDL	.
1245-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (D4)	
1991 FEB	!A	BDL	.	BDL	.
1991 APR	BDL	6.000 <T	.	BDL	.
1991 JUN	BDL	BDL	.	BDL	.
1991 AUG	!AW	!AW	.	BDL	.
1991 OCT	BDL	BDL	.	BDL	.
1991 NOV	BDL	BDL	.	BDL	.
1991 MAR	BDL	BDL	.	BDL	.
1992 JUN	BDL	10.000 <T	.	BDL	.
1992 SEP	BDL	BDL	.	BDL	.
1992 DEC	BDL	BDL	.	BDL	.
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
1991 FEB	!A	BDL	.	BDL	.
1991 APR	BDL	9.000 <T	.	BDL	.
1991 JUN	BDL	BDL	.	BDL	.
1991 AUG	!AW	!AW	.	BDL	.
1991 OCT	BDL	BDL	.	BDL	.
1991 NOV	BDL	BDL	.	BDL	.
1992 MAR	BDL	BDL	.	BDL	.
1992 JUN	BDL	BDL	.	BDL	.
1992 SEP	BDL	BDL	.	BDL	.
1992 DEC	BDL	BDL	.	BDL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHLOROAROMATICS					
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)	
31 SAMPLES	BDL	BDL	.	BDL	.
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 1900 (D4)	
31 SAMPLES	BDL	BDL	.	BDL	.
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 74000 (D4)	
31 SAMPLES	BDL	BDL	.	BDL	.
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
1991 FEB	1A	BDL	.	BDL	.
1991 APR	BDL	BDL	.	BDL	.
1991 JUN	BDL	BDL	.	BDL	.
1991 AUG	1A	1A	.	.	.
1991 OCT	BDL	BDL	.	BDL	.
1991 NOV	BDL	BDL	.	BDL	.
1992 MAR	BDL	BDL	.	.	.
1992 JUN	BDL	BDL	.	BDL	.
1992 SEP	BDL	BDL	.	.	.
1992 DEC	BDL	.	.	BDL	.
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	.	BDL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
CHLOROPHENOLS					
234-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = N/A	
2 SAMPLES	BOL				
2345-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
2 SAMPLES	BOL				
2356-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
2 SAMPLES	BOL				
245-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 2600000 (D4)	
2 SAMPLES	BOL				
246-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)	
1991 JUN	BOL	110.000 <T			
PENTACHLOROPHENOL (NG/L)		DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)	
2 SAMPLES	BOL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
PESTICIDES AND PCB											
ALDRIN (NG/L)		DET'N LIMIT = 1.000 GUIDELINE = 700 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000 GUIDELINE = 700 (G)									
1991 FEB		ILA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR		BDL	2.000 <T	2.000 <T	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG		IAW	IAW	IAW	IAW	IAW	IAW	IAW	IAW	IAW	IAW
1991 OCT		1.000 <T	1.000 <T	1.000 <T	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV		1.000 <T	1.000 <T	1.000 <T	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR		1.000 <T	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BETA BHC (NG/L)		DET'N LIMIT = 1.00 GUIDELINE = 300 (G)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000 GUIDELINE = 4000 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000 GUIDELINE = 7000 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.00 GUIDELINE = 7000 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DIELDRIN (NG/L)		DET'N LIMIT = 2.00 GUIDELINE = 700 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0 GUIDELINE = 900000 (A1)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN I (NG/L)		DET'N LIMIT = 2.00 GUIDELINE = 74000 (D4)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN II (NG/L)		DET'N LIMIT = 5.000 GUIDELINE = 74000 (D4)									
31 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
RAW	TREATED	HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING	GORMAN ST FREE FLOW	GORMAN ST STANDING
PESTICIDES AND PCB							
ENDRIN (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 1600 (D3)			
31 SAMPLES	BDL	BDL	BDL			BDL	
ENDOSULFAN SULPHATE (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = N/A			
31 SAMPLES	BDL	BDL	BDL			BDL	
HEPTACHLOR EPOXIDE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
20 SAMPLES	BDL	BDL	BDL			BDL	
HEPTACHLOR (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
31 SAMPLES	BDL	BDL	BDL			BDL	
MIREX (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
31 SAMPLES	BDL	BDL	BDL			BDL	
OXYCHLORDANE (NG/L)		DET'N LIMIT = 2.000		GUIDELINE = N/A			
31 SAMPLES	BDL	BDL	BDL			BDL	
O,P-DDT (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
31 SAMPLES	BDL	BDL	BDL			BDL	
PCB (NG/L)		DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)			
31 SAMPLES	BDL	BDL	BDL			BDL	
P,P-DDD (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
31 SAMPLES	BDL	BDL	BDL			BDL	
P,P-DDE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)			
31 SAMPLES	BDL	BDL	BDL			BDL	
P,P-DDT (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
31 SAMPLES	BDL	BDL	BDL			BDL	
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)			
28 SAMPLES	BDL	BDL	BDL			BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
PESTICIDES AND PCB					
AMETRINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 300000 (D3)	
14 SAMPLES	BDL				
ATRACINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)	
1991 FEB	330,000 <T				
1991 APR	BDL				
1991 JUN	!AW				
1991 AUG	!AW				
1991 OCT	!AW				
1991 NOV	BDL				
1992 MAR	BDL				
1992 JUN	BDL				
1992 SEP	BDL				
1992 DEC	BDL				
ATRATONE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14 SAMPLES	BDL				
CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL				
DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)	
1991 FEB	210,000 <T				
1991 APR	BDL				
1991 JUN	!AW				
1991 AUG	!AW				
1991 OCT	!AW				
1991 NOV	BDL				
1992 MAR	BDL				
1992 JUN	BDL				
1992 SEP	BDL				
1992 DEC	BDL				
DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL				
PROMETONE (NG/L)		DET'N LIMIT = 50,000		GUIDELINE = 52500 (D3)	
14 SAMPLES	BDL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
PESTICIDES AND PCB					
PROPAZINE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 700000 (D3)	
14 SAMPLES	BDL				
PROMETRYNE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 1000 (A2)	
14 SAMPLES	BDL				
METRIBUZIN (SENCOR) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)	
14 SAMPLES	BDL				
SIMAZINE (NG/L)		DET'N LIMIT = 50.00		GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL				
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A2)	
14 SAMPLES	BDL				
METOLACHLOR (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 50000 (A2)	
14 SAMPLES	BDL				
HEXACHLOROCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = 206000 (D4)	
1991 FEB	13.000 <T	34.000 <T	19.000 <T	48.000 <T	
1991 APR	BDL	70.000	BDL	BDL	
1991 JUN	BDL	BDL	BDL	BDL	
1991 AUG	1AW	1AW	1AW		
1991 OCT	1QU	1QU	1QU	1QU	
1991 NOV	BDL	BDL	BDL	BDL	
1992 MAR	BDL	1QU	1QU		
1992 JUN	1QU	1QU	1QU	1QU	
1992 SEP	1QU	1QU	1QU		
1992 DEC	1QU	1QU		1QU	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

PHENOLICS (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING
			FREE FLOW	STANDING	FREE FLOW	STANDING			
PHENOLICS									
			DET'N LIMIT =		0.2		GUIDELINE = N/A		
1991 FEB		.400 <T		.	.	.	.	.	.
1991 APR		.400 <T		.	.	.	.	.	.
1991 JUN		.800 <T		.	.	.	.	.	.
1991 AUG		.400 <T		.	.	.	.	.	.
1991 OCT		.600 <T		.	.	.	.	.	.
1991 NOV		.800 <T		.	.	.	.	.	.
1992 MAR		.400 <T		.	.	.	.	.	.
1992 JUN		BDL		.	.	.	.	.	.
1992 SEP		BDL		.	.	.	.	.	.
1992 DEC		BDL		.	.	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
POLYAROMATIC HYDROCARBONS					
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
FLUORANTHRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)	
10 SAMPLES	BDL	BDL		BDL	
PYRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
CHRYSENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
BENZO(B) FLUORANTHEN (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
PERYLENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
BENZO(K) FLUORANTHEN (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL		BDL	
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)	
10 SAMPLES	BDL	BDL		BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
POLYAROMATIC HYDROCARBONS					
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL			BDL
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL			BDL
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL			BDL
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL			BDL
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
10 SAMPLES	BDL	BDL			BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
SPECIFIC PESTICIDES					
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
3 SAMPLES	1 LA	BDL		BDL	
2,4,5-T (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 280000 (A1)	
2 SAMPLES	BDL				
2,4-D (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 100000 (A1)	
2 SAMPLES	BDL				
2,4-DB (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = N/A	
2 SAMPLES	BDL				
2,4 D PROPIONIC ACID (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = N/A	
2 SAMPLES	BDL				
DICAMBA (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 120000 (A1)	
2 SAMPLES	BDL				
2,4,5-TP (SILVEX) (NG/L)		DET'N LIMIT = 20.00		GUIDELINE = 10000 (A1)	
2 SAMPLES	BDL				
CARBOFURAN (NG/L)		DET'N LIMIT = 2000.0		GUIDELINE = 90000 (A1)	
2 SAMPLES	BDL				
CHLOROPROPHAM (CIPC) (NG/L)		DET'N LIMIT = 2000.0		GUIDELINE = 350000 (G)	
2 SAMPLES	BDL				
DIALATE (NG/L)		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
2 SAMPLES	BDL				
EPTAM (NG/L)		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
2 SAMPLES	BDL				
IPC (NG/L)		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
2 SAMPLES	BDL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
		HERMAN CR FREE FLOW	HERMAN CR STANDING	HERMAN CR FREE FLOW	HERMAN CR STANDING	GORMAN ST FREE FLOW	GORMAN ST STANDING		
SPECIFIC PESTICIDES									
PROPOXUR (NG/L)		DET'N LIMIT = 2000.0				GUIDELINE = 140000 (D3)			
2 SAMPLES	BDL								
CARBARYL (NG/L)		DET'N LIMIT = 200.0				GUIDELINE = 90000 (A1)			
2 SAMPLES	BDL								
BUTYLATE (NG/L)		DET'N LIMIT = 2000.0				GUIDELINE = 245000 (D3)			
2 SAMPLES	BDL								

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
VOLATILES										
BENZENE (UG/L)			DET'N LIMIT = 0.05				GUIDELINE = 5 (A1)			
1991 FEB	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.
1991 APR	BDL	.050 <T	BDL	.	.	.	BDL	BDL	.	.
1991 JUN	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.
1991 AUG	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1991 OCT	BDL	!EF	BDL	BDL	.	.	BDL	BDL	.	.
1991 NOV	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.
1992 MAR	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1992 JUN	BDL	BDL	BDL	.	.	.	BDL	BDL	.	.
1992 SEP	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1992 DEC	BDL	BDL	BDL	.	.	.	BDL	BDL	.	.
TOLUENE (UG/L)			DET'N LIMIT = 0.05				GUIDELINE = 24 (A3)			
1991 FEB	.050 <T	BDL	BDL	BDL	.	.	BDL	BDL	.	.
1991 APR	BDL	BDL	BDL	.	.	.	BDL	BDL	.	.
1991 JUN	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.
1991 AUG	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1991 OCT	BDL	!EF	BDL	BDL	.	.	BDL	BDL	.	.
1991 NOV	BDL	.050 <T	BDL	.050 <T	.	.	BDL	BDL	.	.
1992 MAR	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1992 JUN	BDL	BDL	BDL	.	.	.	BDL	BDL	.	.
1992 SEP	BDL	BDL	BDL	BDL	.	.	.	.	.	.
1992 DEC	BDL	BDL	BDL	.	.	.	BDL	BDL	.	.
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05				GUIDELINE = 2.4 (A3)			
1991 FEB	BDL	.050 <T	BDL	BDL	.	.	BDL	BDL	.	.
1991 APR	.050 <T	BDL	BDL	.	.	.	BDL	BDL	.	.
1991 JUN	BDL	.050 <T	BDL	BDL	.	.	BDL	BDL	.	.
1991 AUG	BDL	.050 <T	BDL	BDL	.	.	.	.	.	.
1991 OCT	BDL	!EF	BDL	.100 <T	.	.	.	.150 <T	.	.
1991 NOV	BDL	.100 <T	BDL	.100 <T	.	.	.	.150 <T	.	.
1992 MAR	BDL	.100 <T	BDL	.100 <T	.	.	.	.100 <T	.	.
1992 JUN	BDL	.100 <T	BDL	.	.	.	.	.	.	.
1992 SEP	BDL	.050 <T	BDL	.100 <T	.	.	.	.100 <T	.	.
1992 DEC	BDL	BDL	BDL	.	.	.	.100 <T	.	.	.
P-XYLENE (UG/L)			DET'N LIMIT = 0.10				GUIDELINE = 300 (A3*)			
34 SAMPLES	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.
M-XYLENE (UG/L)			DET'N LIMIT = 0.10				GUIDELINE = 300 (A3*)			
34 SAMPLES	BDL	BDL	BDL	BDL	.	.	BDL	BDL	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
VOLATILES					
O-XYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)	
1991 FEB	BDL	BDL	.	BDL	.
1991 APR	BDL	.	.	BDL	.
1991 JUN	BDL	BDL	.	BDL	.
1991 AUG	BDL	BDL	.	.	.
1991 OCT	IEF	BDL	.	BDL	.
1991 NOV	BDL	BDL	.	BDL	.
1992 MAR	BDL	BDL	.	.	.
1992 JUN	BDL	BDL	.	BDL	.
1992 SEP	BDL	BDL	.	.	.
1992 DEC	BDL	.	.	BDL	.
STYRENE (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)	
1991 FEB	.050 <T	.100 <T	.	.050 <T	.
1991 APR	.100 <T	BDL	.	BDL	.
1991 JUN	BDL	BDL	.	.050 <T	.
1991 AUG	BDL	.100 <T	.	.	.
1991 OCT	BDL	.050 <T	.	.250 <T	.
1991 NOV	BDL	.150 <T	.	.300 <T	.
1992 MAR	BDL	.300 <T	.	.	.
1992 JUN	BDL	.150 <T	.	.150 <T	.
1992 SEP	.050 <T	.100 <T	.	.	.
1992 DEC	BDL	.050 <T	.	.150 <T	.
1,1-DICHLOROETHYLENE (UG/L)					
		DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)	
34 SAMPLES	BDL	BDL	.	BDL	.
METHYLENE CHLORIDE (UG/L)					
		DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)	
34 SAMPLES	BDL	BDL	.	BDL	.
T12-DICHLOROETHYLENE (UG/L)					
		DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)	
34 SAMPLES	BDL	BDL	.	BDL	.
1,1-DICHLOROETHANE (UG/L)					
		DET'N LIMIT = 0.100		GUIDELINE = N/A	
34 SAMPLES	BDL	BDL	.	BDL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
VOLATILES					
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 FEB	BDL				
1991 APR	38.700	35.100		37.100	
1991 JUN	49.400			40.600	
1991 AUG	36.300	38.500		34.000	
1991 OCT	41.000	39.700			
1991 NOV	IEF	37.600		36.600	
1991 DEC	38.100	36.100		35.000	
1992 JAN	36.200	33.800			
1992 FEB	35.600			31.200	
1992 MAR	30.600	32.400			
1992 APR	44.800			37.200	
1,1,1-TRICHLOROETHANE (UG/L)					
		DET'N LIMIT = 0.02		GUIDELINE = 200 (D1)	
1991 FEB	BDL	BDL		.060 <T	
1991 APR	BDL			BDL	
1991 JUN	BDL	BDL		BDL	
1991 AUG	BDL	BDL			
1991 OCT	IEF	BDL		BDL	
1991 NOV	BDL	BDL		BDL	
1991 DEC	BDL	BDL			
1992 JAN	BDL			BDL	
1992 FEB	BDL	BDL			
1992 MAR	BDL			BDL	
1992 APR	BDL				
1,2-DICHLOROETHANE (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)	
34 SAMPLES	BDL	BDL		BDL	
CARBON TETRACHLORIDE (UG/L)					
		DET'N LIMIT = 0.20		GUIDELINE = 5 (A1)	
34 SAMPLES	BDL	BDL		BDL	
1,2-DICHLOROPROPANE (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 5 (D1)	
34 SAMPLES	BDL	BDL		BDL	
TRICHLOROETHYLENE (UG/L)					
		DET'N LIMIT = 0.10		GUIDELINE = 50 (A1)	
34 SAMPLES	BDL	BDL		BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
VOLATILES					
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
1991 FEB	BDL	3.950	3.000	.	3.200
1991 APR	.800	3.600	.	.	2.250
1991 JUN	BDL	3.300	2.800	.	2.300
1991 AUG	BDL	3.500	2.950	.	.
1991 OCT	BDL	!EF	3.600	.	3.100
1991 NOV	BDL	4.150	3.650	.	3.250
1992 MAR	BDL	3.900	3.200	.	.
1992 JUN	BDL	3.800	.	.	2.750
1992 SEP	BDL	3.400	3.450	.	.
1992 DEC	BDL	4.050	.	.	2.600
112-TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 0.6 (D4)	
34 SAMPLES	BDL	BDL	BDL	.	BDL
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 FEB	BDL	.200 <T	.200 <T	.	.200 <T
1991 APR	BDL	.200 <T	.	.	.100 <T
1991 JUN	BDL	BDL	BDL	.	BDL
1991 AUG	BDL	BDL	BDL	.	.
1991 OCT	BDL	!EF	BDL	.	BDL
1991 NOV	BDL	BDL	BDL	.	BDL
1992 MAR	BDL	BDL	BDL	.	.
1992 JUN	BDL	BDL	.	.	BDL
1992 SEP	BDL	BDL	BDL	.	.
1992 DEC	BDL	BDL	.	.	BDL
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 65 (A5)	
1991 FEB	BDL	BDL	BDL	.	BDL
1991 APR	BDL	BDL	.	.	BDL
1991 JUN	BDL	BDL	BDL	.	BDL
1991 AUG	BDL	BDL	BDL	.	.
1991 OCT	BDL	!EF	BDL	.	BDL
1991 NOV	BDL	BDL	BDL	.	BDL
1992 MAR	BDL	BDL	BDL	.	.
1992 JUN	BDL	BDL	.	.	BDL
1992 SEP	BDL	.150 <T	BDL	.	.
1992 DEC	BDL	BDL	.	.	BDL
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
34 SAMPLES	BDL	BDL	BDL	.	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW	DIST. SYSTEM HERMAN CR STANDING	DIST. SYSTEM GORMAN ST FREE FLOW	DIST. SYSTEM GORMAN ST STANDING
VOLATILES					
1122-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 0.17 (D4)	
34 SAMPLES	BDL	BDL		BDL	
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 2 (D1)	
12 SAMPLES	BDL	BDL		BDL	
C12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 70 (D1)	
12 SAMPLES	BDL	BDL		BDL	
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 1510 (D3)	
34 SAMPLES	BDL	BDL		BDL	
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 5 (A1)	
34 SAMPLES	BDL	BDL		BDL	
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 3750 (D3)	
34 SAMPLES	BDL	BDL		BDL	
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)	
34 SAMPLES	BDL	BDL		BDL	
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50 (D1)	
34 SAMPLES	BDL	BDL		BDL	
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)	
1991 FEB	BDL				
1991 APR	7.600			40.450	
1991 JUN	53.150			40.700	
1991 AUG	39.600			36.300	
1991 OCT	44.500				
1991 NOV	42.650			39.700	
1991 DEC	41.200			38.250	
1992 JAN	42.250				
1992 FEB	40.100			33.950	
1992 MAR	39.400				
1992 APR	34.000			39.800	
1992 MAY	48.850				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 NORTH BAY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM HERMAN CR FREE FLOW		DIST. SYSTEM HERMAN CR STANDING		DIST. SYSTEM GORMAN ST FREE FLOW		DIST. SYSTEM GORMAN ST STANDING	
RADIONUCLIDES										
COBALT 60 (BQ/L)			DET'N LIMIT = 0.70		GUIDELINE = N/A					
6 SAMPLES		BDL	BDL		.		.		.	
CESIUM 134 (BQ/L)			DET'N LIMIT = 0.70		GUIDELINE = N/A					
6 SAMPLES		BDL	BDL		.		.		.	
CESIUM 137 (BQ/L)			DET'N LIMIT = 0.70		GUIDELINE = 50 (A1)					
6 SAMPLES		BDL	BDL		.		.		.	
GROSS ALPHA COUNT (BQ/L)			DET'N LIMIT = 0.04		GUIDELINE = 0.55 (D1)					
1991 JUN		BDL	.		.		.		.	
1991 OCT		.040	.		.		.		.	
1992 JUN		BDL	.		.		.		.	
GROSS BETA COUNT (BQ/L)			DET'N LIMIT = 0.04		GUIDELINE = N/A					
1991 JUN		.070	.		.		.		.	
1991 OCT		.080	.		.		.		.	
1992 JUN		.060	.		.		.		.	
TRITIUM (BQ/L)			DET'N LIMIT = 7.00		GUIDELINE = 40000 (A1)					
6 SAMPLES		BDL	BDL		.		.		.	
IODINE 131 (BQ/L)			DET'N LIMIT = 0.70		GUIDELINE = 10 (A1)					
6 SAMPLES		BDL	BDL		.		.		.	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER -----	UNIT ----	DETECTION LIMIT -----	GUIDELINE -----
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (1)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADAX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
-----	----	-----	-----
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER -----	UNIT ----	DETECTION LIMIT -----	GUIDELINE -----
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu g/L$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF
HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN
WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS
AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT
A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES,
SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM
SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR
DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES;
COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER
COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND
RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING
AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING
BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION
WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION,
COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION,
OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to .5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

